Patent application of
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for
MOBILE OBJECT WITH FORCE GENERATORS

FIELD OF THE INVENTION

The invention relates to vehicle technology and specifically to flying objects.

DISCUSSION OF PRIOR ART

All the recent man-made vehicles start and accelerate, speed up or slow down, with the help of either external force, or reaction force, or jet, or their combination. The vehicles are passive in relation to those forces, because the forces are external. Using the external thrusts confines motion possibility of the vehicles, since the vehicles need complex structures and specific conditions for their motion. For example, aircraft needs large wings and expensive airports for lifting and landing; helicopter needs very large blades of its rotor in comparison with its body. Both of them cannot fly at very high altitude because of decreasing of the air density along the altitude of the atmosphere. Spaceship needs an expensive starting complex and cannot accelerate any more after running out of fuel for jet propulsion. Therefore, the maximum speed of the man-made spaceships is very small in comparison with the light speed. On the earth surface ship needs sufficiently deep water to move, submarine cannot dive down too deep because of water pressure, automobile needs motorways, train needs railways, etc. Consequently, the

mankind's transport systems are very complicated, expensive, and constrained, and have low safety.

All the man-made vehicles are passive because their motion is based on Newton's laws of motion, in accordance with that the total of internal forces of each vehicle must be zero. However, the laws are stated only for solid bodies or systems of rigid particles and the total internal force may differ from zero for some bodies of other nature. For example, the sum of internal forces of a moving charged particle can differ from zero, although the sum is rather small. So far there has been virtually no exploration of any other body, which can generate a sufficiently large total internal force for practical application in vehicle technology.

OBJECTS AND ADVANTAGES

Accordingly, the main objects and advantages of my invention are to provide vehicles with mechanisms which allow the vehicles to generate their own total internal force that is their self-action force for starting, accelerating, lifting, landing, and moving in any direction in the air, cosmos, and water (if it is sealed), and on any ground surface and water surface (if the lower part of its body is sealed). The vehicles will make the mankind's transport system much more flexible, simple, cheap, safe, and faster in both the earth's environment and universe.

The above and another objects, advantages and features of my invention will become apparent following examination of drawings and ensuing description herein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic isometric view of a mobile object equipped with a force generator with a fragment of the shell of a generator chamber removed to show the arrangement of components of the force generator inside the generator chamber.

FIG. **2** is a side schematic view of the mobile object of FIG. **1** with the shell of the generator chamber removed.

FIG. **3** is a schematic plan view of a disk-stator of the force generator of the mobile object of FIG. **1**.

FIG. **4** is a schematic perspective view of a rotor of the force generator of the mobile object of FIG. **1**.

FIG. **5** is a diagram of relative position of the solid surfaces inside the mobile object of FIG. **1** with respective labels of the pressure distributions acting on them.

FIG. **6** is a diagram of the pressure distributions over the surfaces of the top disk of the rotor of FIG. **4** and the disk-stator of FIG. **3**.

FIG. **7** is a schematic perspective view of a modification of the rotor of FIG. **4**.

FIG. **8** is a schematic perspective view of a modification of the disk-stator of FIG. **3**.

FIG. **9** is a top plan view of a modification of the mutual pair of the rotor of FIG. **4** and the disk-stator of FIG. **3**.

FIG. **10** is a schematic sectional view of the mutual pair of the rotor and the stator of FIG. **9** taken on line **10-10**.

FIG. **11** is a schematic perspective view of an alternative mutual pair of rotor and stator.

FIG. **12** is the shape of dividing walls of the mutual pair of rotor and stator of FIG. **11**.

FIG. **13** is a schematic perspective view of another mutual pair of rotor and stator.

FIG. **14** is the shape of dividing walls of the mutual pair of rotor and stator of FIG. **13**.

FIG. **15** is a schematic side view of a ring-rotor.

FIG. **16** is a schematic top plan view of the ring-rotor of FIG. **15**.

FIG. **17** is a schematic sectional view of the ring-rotor of FIG. **15** taken on line **17-17**.

FIG. **18** is a schematic top plan view of a ring-stator.

FIG. **19** is a schematic front elevational view of an alternative force generator constructed on the base of a rotor of blades having an airfoil cross-section with a fragment of the shell of its generator chamber removed.

FIG. **20** is a schematic plan view of arrangement of force generators in a conventional aircraft.

FIG. **21** is a schematic side view of an aircraft with its rings removed being equipped with force generators for lifting and propulsion.

FIG. **22** is a schematic plan view of arrangement of the force generators in the aircraft of FIG. **21**.

FIG. **23** is a schematic side view of a mobile object having a flying saucer shaped body equipped with force generators.

FIG. **24** is a schematic sectional view of the mobile object of FIG. **23** taken on line **24-24** to show a schematic plan arrangement of its force generators and power devices.

FIG. **25** is an enlarged schematic side view of a turntable supporting force generators.

FIG. **26** is a schematic side view of an alternative mobile object equipped with force generators.

Fig. **27** is a schematic sectional view of the mobile object of FIG. **26** taken on line **27-27** to show a schematic plan arrangement of its force generators and power devices.

REFERENCE NUMERALS OF DRAWINGS

40 mobile object	42 force generator
44 engine	46 gearbox
48 generator chamber	50 structural frame
52 disk-stator	54 rotor
56 shaft	58 fan
60 fan duct	62 generator frame
64 central circular hole	66 hole
68 circumferential tube	70 top disk
72 open bottom	74 central tube
76 dividing wall	78 bearing
80 bearing	82 bearing housing
84 bearing housing	86 supporter
88 supporter	90 nut
92 washer	94 supporter
96 pulley	98 belt
100 shell	102 rotor
104 stator	106 circumferential tube
108 top disk	110 dividing wall
112 disk	114 circumferential tube
116 rotor	118 stator
120 exterior end	122 dividing wall

124 slit
128 circumferential tube
132 disk-stator
136 trapezium
140 stator
144 curve
148 ring-rotor
152 central tube
156 dividing wall
160 open bottom
164 ring-stator
168 mobile object
172 generator chamber
176 supporter
180 structural frame
184 gearbox
188 mobile object
192 force generator
196 engine
198 engine
200 force generator
204 engine
206 engine
208 mobile object
212 force generator
216 force generator
220 force generator
224 generator chamber
228 engine
230 engine
232 engine
234 engine
236 engine

126 circumferential tube
130 rotor
134 dividing wall
138 rotor
142 dividing wall
146 straight line
150 circumferential tube
154 shaft tube
158 top ring
162 rod
166 hole
170 rotor of blades
174 shaft
178 supporter
182 engine
186 pump system
190 aircraft
194 force generator
197 mechanical transmission means
199 mechanical transmission means
202 force generator
205 mechanical transmission means
207 mechanical transmission means
210 aircraft with its rings removed
214 force generator
218 force generator
222 force generator
226 floor
229 mechanical transmission means
231 mechanical transmission means
233 mechanical transmission means
235 mechanical transmission means
237 mechanical transmission means

238 engine
239 mechanical transmission means
240 rudder
242 cockpit
244 mobile object
246 flying saucer shaped body
248 passenger cabin
250 machine cabin
252 generator chamber
254 cockpit
256 structural frame
258 floor
260 ladder
262 door
264 window
266 suspension pier
268 wheel
270 photovoltaic panels
272 force generator
274 force generator
276 force generator
278 force generator
280 force generator
282 force generator
284 engine
285 selectively disengaging means
286 electrical motor
287 selectively disengaging means
288 mechanical transmission means
290 engine
291 selectively disengaging means
292 electrical motor
293 selectively disengaging means
294 mechanical transmission means
296 engine
297 selectively disengaging means
298 electrical motor
299 selectively disengaging means
300 mechanical transmission means
302 engine
303 selectively disengaging means
304 electrical motor
305 selectively disengaging means
306 mechanical transmission means
308 engine
309 selectively disengaging means
310 electrical motor
311 selectively disengaging means
312 mechanical transmission means
314 auxiliary power unit
316 pump system
318 special gateway
320 turntable
322 control motor
324 turning supporter
326 structural supporter
328 gearwheel
330 small gearwheel
332 hole
334 cylindrical shaft
336 bearing
338 bore
340 shaft
342 clutch
343 shaft
344 control unit

345 fuel tank
346 mobile object
348 body of aerodynamic shape
350 pilot cabin
352 machine cabin
354 rudder
356 structural frame
358 floor
360 lower section of a floor
362 glass screen
364 door
366 suspension pier
368 wheel
370 force generator
372 force generator
374 engine
376 mechanical transmission means
378 engine
380 mechanical transmission means
382 rectangular frame
384 shaft
386 strut
388 strut
390 hydraulic jack
392 hydraulic jack
398 engine
400 mechanical transmission means
402 control unit
404 fuel tank

SUMMARY OF THE PRINCIPLES OF THE INVENTION

In the present invention mobile objects including all types of vehicles generate their self-action force for self-propulsion due to equipping with a new invented mechanism that is called a force generator.

Each force generator is a propulsion mechanism that converts directly a rotational energy of an engine into self-action force of a mobile object containing the propulsion mechanism due to relative motion between the surfaces of its solid structure and a working gas filling a generator chamber in which the force generator is installed.

The force generator comprises, in combination, a mutual pair of a rotor and a stator, a generator frame, and a compensating gas means. The rotor includes a shaft, a shell, and a plurality of dividing walls. The shaft has bearing supporters being secured to the generator frame. The dividing walls extend from the shaft and an upper part of the surface swept by the edges of the dividing walls due to their rotation about the axis of the shaft is covered by the shell. The surface swept by the uncovered part of the edges of the dividing walls due to their rotation about the axis of the shaft forms an open rotary surface of the rotor. The stator is a rigid member and has a fitting surface, which is a part of the surface of the

stator that fits the open rotary surface of the rotor. The stator is secured to the generator frame and located under the rotor. The clearance between the open rotary surface and the fitting surface is such small that the space bounded by the rotor and the stator is divided into separate sections rotating about the axis of the shaft and the uncovered part of the edges of the dividing walls skims the fitting surface of the stator to accompany the working gas filling said space during rotation of the rotor. Whereby the working gas filling said space rotates together with the rotor and sweeps over the fitting surface of the stator during rotation of the rotor. That results in a difference in pressure distribution over the lower and upper surfaces of the shell of the rotor and a difference in pressure distribution over the lower and upper surfaces of the stator during rotation of the rotor. The total force obtained by the differences in pressure distribution is the force generated by the force generator. That force acts on a mobile object equipped with the force generator through the shaft, mechanical joints, fasteners, supporters, and generator frame of the force generator in the upward direction along the shaft of the rotor. The force generated by the force generator depends on the properties (pressure, temperature, density) of the working gas filling the generator chamber. The compensating gas means serves for pumping into said space the amount of the working gas that compensates the amount of the working gas exhausted out of said space due to the centrifugal force.

The force generated by the force generator is the internal force of the mobile object, since it is defined only by interaction between the surfaces of the solid structure and the flows of the working gas inside the mobile object. Therefore, the force generated by the force generator is the self-action force of the mobile object and does not depend on the outer environment surrounding the mobile object.

In general, each mobile object can be equipped with a plurality of the force generators and the total of the internal forces generated by the force generators is its self-action force. The direction of the force generated by each of the force generators is defined by the direction of its shaft in depending on its installation. For example, the force generator may be vertically mounted (with shaft in vertical direction), horizontally mounted (with shaft in horizontal direction), or mounted at any angle (with shaft under an angle relative to the horizontal plane), etc. The direction of the shaft can be also controlled by a control means. Therefore, a mobile object equipped with the force generators can accelerate in any direction and implement any maneuver by controlling the force generated by each force generator (or its angular velocity) and the direction of its shaft. Since the

force generators can be mounted inside each mobile object, the mobile object can start, accelerate, lift, land, and move in any direction in the air, cosmos, and water (if it is sealed) and on any ground surface and water surface (if the lower part of its body is sealed).

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings, a mobile object constructed in accordance with one embodiment of the present invention is indicated generally at **40** in FIG. **1**. Mobile object **40** includes a force generator indicated generally at **42**, an engine **44**, a gearbox **46**, a generator chamber **48**, and a structural frame **50**. Force generator **42** comprises (see also FIG. **2**) a disk-stator **52**, a rotor **54**, a shaft **56** of the rotor, a fan **58**, a fan duct **60**, and a generator frame **62**. Disk-stator **52** (see also FIG. **3**) is a disk having a central circular hole **64** as a free space for assembly of the disk-stator and the shaft, and a hole **66** being the outlet of fan duct **60**. Rotor **54** comprises (see also FIG. **4**) a circumferential tube **68** having its upper end closed by a top disk **70**, an open bottom **72**, a central tube **74** for the shaft assembly, and dividing walls **76**. Dividing walls **76** extend from central tube **74** to circumferential tube **68** and from top disk **70** to open bottom **72** so that dividing walls **76** together with central tube **74** divide the inner space of rotor **54** into separate sections. Shaft **56** is supported by bearings **78** and **80** arranged in bearing housings **82** and **84** respectively. The bearing housings **82** and **84** are secured to supporters **86** and **88** respectively. Disk–stator **52** and supporters **86** and **88** are secured to generator frame **62** of the force generator by screws or other suitable fasteners. Rotor **54** is mounted on shaft **56** and is secured by a nut **90** with a washer **92** on its top. Fan **58** is mounted to a supporter **94** being secured to generator frame **62** (or to structural frame **50**). Shaft **56** has a pulley **96** (or a gear) which together with a belt **98** (or a gear train) and a pulley (not shown) on the shaft (or a gear on the shaft) of fan **58** serves as a mechanical transmission means from shaft **56** of rotor **54** to the shaft of fan **58**. Generator frame **62** of the force generator is secured to structural frame **50** of mobile object **40** by welds or other suitable fasteners. The structure of shaft **56** provides such a position of rotor **54** that after the assembly of force generator **42** the clearance between the upper surface of disk-stator **52** and the plane of open bottom **72** of rotor **54** is as small as possible. Gearbox **46** is a mechanical

transmission means from engine **44** to shaft **56**. Generator chamber **48** has a shell **100** being secured to structural frame **50** by a suitable means. Generator chamber **48** is filled with a working gas, which may be the air or any other gas. Engine **44** may be of turbo-prop, prop-fan, piston engine, or other types. The engine may be also an electrical motor, particularly when the solar energy is used. Engine **44** and gearbox **46** are secured to structural frame **50** by suitable means (not shown). Engine **44** in FIG. **1** is located outside shell **100** of generator chamber **48**. Engine **44** may be also situated inside generator chamber **48**. In that case the inlet and outlet passages of air flows and exhausted gases necessary for operation of the engine should be isolated from the working gas in generator chamber **48**. Rotor **54** can be made of aluminum alloy, steel, composite materials, or other suitable rigid materials. It is desirable to make the rotor as light as possible for the sake of saving energy. Disk-stator **52** can be made of aluminum alloy, steel, composite materials, or other rigid materials. Shell **100** can be made of steel or any other rigid materials, provided the shell can suffer the pressure of the working gas. In some applications generator chamber **48** may be pressurized. In that case a means (not shown) for pressurizing the generator chamber may be powered from engine **44**.

In operation, rotor **54** and fan **58** are driven from engine **44** through gearbox **46**. During rotation of rotor **54** the working gas in the space bounded by disk-stator **52** and rotor **54** rotates together with the rotor and sweeps over the upper surface of disk-stator **52** due to dividing walls **76** which skim the upper surface of disk-stator **52** to accompany the working gas. Because of the centrifugal force some part of the working gas in the space bounded by disk-stator **52** and rotor **54** is exhausted through the clearance between the upper surface of disk-stator **52** and the circumference of open bottom **72** or the bottom edge of circumferential tube **68** of rotor **54**. The exhausted gas is continuously compensated by the gas flows entering into the space bounded by disk-stator **52** and rotor **54** through fan duct **60** due to the operation of fan **58**. The rotation of rotor **54** creates different relative gas flows over the surfaces of disk-stator **52** and rotor **54**. The different relative gas flows, in turn, exert different pressures on the surfaces. As a result, the difference in pressure distribution over the lower and upper surfaces of disk-stator **52** and the difference in pressure distribution over the lower and upper surfaces of top disk **70** of rotor **54** exert forces on disk-stator **52** and rotor **54** respectively. The sum of the forces

acts on mobile object **40** through the shaft, mechanical joints, fasteners, supporters, and structural frame of the mobile object in the upward direction along shaft **56** (from the lower surface to upper surface of the disk-stator or the top disk of the rotor). The sum of the forces generated by force generator **42** is the self-action force of mobile object **40**, since it is the internal force of the mobile object. The detailed discovery of the self-action force of mobile object **40** generated by its force generator **42** is explained by considering the pressure distributions of the gas flows over the solid surfaces inside mobile object **40**. FIG. **5** is a diagram of relative position of the solid surfaces inside mobile object **40**. The letter P with a subscript denotes the pressure distribution over each solid surface. P_1 and P_2 are the pressure distributions over the upper and lower surfaces of top disk **70** of rotor **54** respectively. P_3 and P_4 are the pressure distributions over the upper and lower surfaces of disk-stator **52** respectively. P_5 and P_6 are the pressure distributions over the inside and outside surfaces of circumferential tube **68** respectively. P_7, P_8, and P_9 are the pressure distributions over the surfaces of the ceiling, floor, and wall of generator chamber **48** respectively. Finally, we denote the static pressure in generator chamber **48** by P_0, that is the pressure in the state when force generator **42** is at rest. It is obvious that P_7 and P_8 are almost equal to P_0 and the resultant aerodynamic forces acting on mobile object **40** from the pressure distributions P_7 and P_8 cancel each other. The resultant aerodynamic force acting on mobile object **40** from the pressure distribution P_9 vanishes because of the symmetry of the pressure distribution. The resultant aerodynamic forces acting on the inside and outside surfaces of circumferential tube **68** of rotor **54** from the pressure distributions P_5 and P_6 respectively are equal to zero due to the geometric symmetry of the circumferential tube relative to the rotational axis of rotor **54**. Therefore, the resultant aerodynamic forces acting on mobile object **40** from the pressure distributions P_1, P_2, P_3, and P_4 remain to be considered. FIG. **6** is a diagram of the pressure distributions over the upper and lower surfaces of top disk **70** (P_1 and P_2) and disk-stator **52** (P_3 and P_4). At a given angular velocity of rotor **54** the velocity at each point of the surface of top disk **70** is the angular velocity times the radius of the circle of the point's trajectory. The point's velocity is also the relative velocity of the gas flow above the circle with respect to the upper surface of top disk **70**. Therefore, the pressure distribution P_1 over the upper surface of top disk **70** reduces with increasing of the radius denoted by **r** in FIG. **6**. In the figure

R is the radius of circumferential tube **68**. The gas in the space bounded by stator **52** and rotor **54** rotates together with the rotor due to dividing walls **76**. Consequently, the relative velocity of the gas flow inside rotor **54** with respect to the lower surface of top disk **70** is almost equal to (or a little greater than) zero. Therefore, the pressure distribution $\mathbf{P_2}$ over the lower surface of top disk **70** is almost constant and equal to (or a little less than) the static pressure $\mathbf{P_0}$. Then the difference in pressure distribution, $\mathbf{P_2\text{-}P_1}$, between the lower and upper surfaces of top disk **70** rises along the radius **r**. The difference in pressure, when multiplied by the area over which it acts, produces the force acting on top disk **70** or rotor **54** in the direction along the axis of the rotor from the lower surface to the upper surface of top disk **70**. While the gas in the space bounded by disk-stator **52** and rotor **54** rotates together with the rotor due to dividing walls **76**, disk-stator **52** is fixed. Therefore, the gas inside rotor **54** sweeps over the upper surface of disk-stator **52**. Then the relative velocity of the gas flow over the upper surface of disk-stator **52** increases with increasing of the radius **r**. Consequently, the pressure distribution $\mathbf{P_3}$ over the upper surface of disk-stator **52** reduces with increasing of the radius **r**. Finally, the pressure distribution $\mathbf{P_4}$ over the lower surface of disk-stator **52** is almost constant and equal to the static pressure $\mathbf{P_0}$, because the disk-stator is fixed and the relative velocity of the gas flow over its lower surface is almost zero. Then the difference in pressure distribution, $\mathbf{P_4\text{-}P_3}$, between the lower and upper surfaces of disk-stator **52** rises along the radius **r**. The difference in pressure, when multiplied by the area over which it acts, produces the force acting on disk-stator **52** in the direction along the axis of rotor **54** from the lower surface to the upper surface of disk-stator **52**. The sum of the resultant aerodynamic forces created by the differences in pressure distribution, ($\mathbf{P_2\text{-}P_1}$) and ($\mathbf{P_4\text{-}P_3}$), is the force generated by force generator **42** in the direction along the axis of rotor **54** from the lower surface to the upper surface of disk-stator **52** or top disk **70**. The force is the thrust force generator **42** acts on the whole body of mobile object **40** through its shaft, mechanical joints, fasteners, supporters, and the structural frame of the mobile object in the upward direction along the axis of shaft **56**. The force generated by force generator **42** is the internal force of mobile object **40**, since it is defined only by interaction between the surfaces of the solid structure and the flows of the working gas inside the mobile object, that is the generated force is the

self-action force of mobile object **40** and does not depend on the outer environment surrounding the mobile object.

The discovery of the self-action force of mobile object **40** is explained by the distinction in nature between mobile object **40** and solid bodies. It is known that Newton's laws are stated for (absolutely) solid bodies or systems of rigid particles. While mobile object **40** is a solid-fluid body, which is a solid body enclosing fluid flows in its inside space. For the solid-fluid body Newton's third law is applied to individual fluid particles during their collision with the solid surfaces inside the solid-fluid body. The reaction forces of the solid surfaces acting on the particles colliding with them cannot be added together to get a total, since the particles are individual. Therefore, the reaction forces influence the fluid flows only by the diffusion of the momentum of the colliding particles. The momentum diffusion, in turn, affects the behavior of the fluid flows inside the solid-fluid body. However, the total force of the fluid flows acting on the solid surfaces inside the solid-fluid body has been obtained from the pressure distributions on all the solid surfaces. This means that the effect of the diffusion of the momentum of the colliding particles on the fluid flows has been already accounted in receiving the total force. The self-action force of the mobile object can be approximately calculated by the theory of inviscid compressible flow for the case of ideal implementation (the exhausted gas is being compensated momentarily). In accordance with the theory the self-action force is proportional to the static pressure $\mathbf{P_0}$, proportional to about square of the angular velocity and to about fourfold power of the radius of rotor **54**. For example, with the working gas being the air the self-action force generated by the force generator of 0.5 meter radius at the pressure 101,000N/m2 (the pressure of the air at sea level) is about 8,000N (Newtons) at velocity 2,500r/m (rounds per minute) and about 29,000N at velocity 5,000r/m; The self-action force generated by the force generator of 1 meter radius at the pressure 101,000N/m2 is about 119,000N at velocity 2,500r/m and about 370,000N at velocity 5,000r/m. Therefore, the self-action force of the force generator of a sufficiently small radius can get a large value at a sufficiently low angular velocity. The large value of the self-action force is achieved due to the special structure of the force generator, which gives almost the maximum differences in pressure distribution over the lower and upper surfaces of top disk **70** and disk-stator **52**.

If mobile object **40** operates in the atmosphere and the working gas is the air at the atmospheric pressure, the earth's atmosphere can serve as a generator chamber of mobile object **40**. In that case shell **100** may be removed or the generator chamber needs not to be pressurized. In FIGS. **1** and **4** rotor **54** has four dividing walls. In general, the number of dividing walls of the rotor may be chosen arbitrary from the conditions of the strength and dynamic balance of the rotor. In FIGS. **1** and **2** force generator **42** has one fan in a fan duct. In general, the number of fans and, therefore, fan ducts, may be chosen arbitrary, provided they provide sufficient and almost momentary compensation of the exhausted gas. In FIG. **1** and **2** central tube **74** serves as an assembling member for assembly of shaft **56**. The central tube may be not necessary if dividing walls **76** extend directly from the shaft. Fan **58** in fan duct **60** is a compensating gas means for pumping the working gas into the space bounded by rotor **54** and disk-stator **52** to compensate the amount of the working gas exhausted out of that space due to the centrifugal force. For speeding the compensation process a compressor may be used instead of the fan in the fan duct. In some applications a hole through the disk-stator may be used as a compensating gas means. In that case the gas is sucked into the interior space of the rotor through the hole by natural way. Shaft **56** of rotor **54** of mobile object **40** shown in FIG. **1** is supported by bearing arrangement in both sides of the rotor. They may be also supported by bearing arrangement in one side of the rotor.

From the above consideration of operation of mobile object **40** we notice that rotor **54** and disk-stator **52** constitute a mutual pair in the meaning of their geometric structure. The basic feature of the geometric structure of the mutual pair of rotor **54** and stator **52** is the division of the space bounded by the rotor and disk-stator into separate sections such that the separate sections rotate together with rotor **54** and the uncovered lower edges of dividing walls **76** skim the upper surface of disk-stator **52**. The mutual structure of rotor **54** and stator **52** makes the working gas in the space bounded by the rotor and stator rotate together with rotor **54** and sweep over the upper surface of disk-stator **52**. In other words, in the mutual structure the rotor is an accompanying gas means for accompanying a gas volume sweep over a part of the surface of the disk-stator. Therefore, the geometric structure of the mutual pair of the rotor and disk-stator can be modified provided they have the basic feature of the geometric structure. For example, the mutual pair of rotor **54** and disk-stator **52** may be replaced by the mutual pair of a rotor **102** and a stator **104**

illustrated in FIGS. **7** and **8** respectively. In FIG. **7** rotor **102** has a circumferential tube **106**, a top disk **108** and dividing walls **110**. In FIG. **8** stator **104** has a disk **112** and a circumferential tube **114**. Rotor **102** differs from rotor **54** by removing a lower part of circumferential tube **68**, i.e. rotor **102** has circumferential tube **106** being shorter than circumferential tube **68**. Stator **104** differs from disk-stator **52** by adding circumferential tube **114** to the upper surface of the disk-stator such that the added circumferential tube **114** fits the removed lower part of circumferential tube **68**. FIGS. **9** and **10** illustrate another mutual pair of a rotor **116** and stator **118**. Rotor **116** differs from rotor **54** by removing an exterior end **120** of the lower part of dividing walls **122** to create a slit **124** between a circumferential tube **126** and each of dividing walls **122**. Stator **118** differs from disk-stator **52** by adding a circumferential tube **128** such that the added tube **128** fits slit **124**.

From the illustrated above pairs of rotor and stator we notice that each pair of a rotor and a stator can be constructed by the following way. The rotor includes a shaft, a shell, and a plurality of dividing walls. The shaft has bearing supporters being secured to the generator frame. The dividing walls extend from the shaft and an upper part of the surface swept by the edges of the dividing walls due to their rotation about the axis of the shaft is covered by the shell (the upper part may include the full outer edges of the dividing wall and even a apart of the bottom edges). The shaft may be separate and the rotor has an assembling member for assembly of the shaft. The surface swept by the uncovered part of the edges of the dividing walls due to their rotation about the axis of the shaft forms an open rotary surface of the rotor. The stator is a rigid member and has a fitting surface, which is a part of the surface of the stator that fits the open rotary surface of the rotor. The stator is secured to the generator frame and located under the rotor. The clearance between the open rotary surface of the rotor and the fitting surface of the stator is such small that the space bounded by the rotor and stator is divided into separate sections rotating about the axis of the shaft and the uncovered part of the edges of the dividing walls skims the fitting surface of the stator to accompany the working gas filling the space bounded by the rotor and the stator during rotation of the rotor. Whereby the working gas filling the space bounded by the rotor and the stator rotates together with the rotor and sweeps over the fitting surface of the stator during rotation of the rotor. For example, in the mutual pair of rotor **102** and stator **104** illustrated in FIGS. **7** and **8** each

dividing wall **110** has a form of a rectangular plate. The shell includes circumferential tube **106** covering an upper part of the outer edges of the dividing walls and top disk **108** covering the upper end of circumferential tube **106** or the top edges of dividing walls **110**. The remained uncovered part of the surface obtained by rotation of each dividing wall **110** about the axis of the shaft of rotor **102** is the open rotary surface of rotor **102**. The interior surface of circumferential tube **114** and the part of the upper surface of disk **112** bounded by the bottom circumference of circumferential tube **114** constitute the fitting surface of stator **104** that fits the open rotary surface of rotor **102**. During rotation of rotor **102** the uncovered part of the edges of dividing walls **110** skims the fitting surface of stator **104**. For the other example, in the mutual pair of rotor **116** and stator **118** illustrated in FIGS. **9** and **10** the shell of rotor **116** also covers only an upper part of the edges of dividing walls **122**, since slit **124** exists between the remained uncovered part of the edges of the dividing walls and the lower part of circumferential tube **126**. Therefore, the open rotary surface of rotor **116** consists of the part of the surface swept by exterior edge **120** of the lower uncovered part of each dividing wall **122** due to its rotation about the axis of rotor **116** and the uncovered bottom surface of the rotor. Then the fitting surface of stator **118** consists of the interior surface of circumferential tube **128** and the part of the upper surface of the disk of the stator bounded by the bottom circumference of circumferential tube **128**. We notice that the geometric shape of each mutual pair of a rotor and a stator is defined by the form of dividing walls of the rotor. FIG. **11** illustrates the geometric shape of the mutual pair of a rotor **130** and a disk-stator **132**, which is defined by dividing walls **134** having the form of a trapezium **136** shown in FIG. **12**. FIG. **13** illustrates the geometric shape of the mutual pair of a rotor **138** and a stator **140**, which is defined by dividing walls **142** having the form consisting of a curve **144** and a straight line **146** shown in FIG. **14**.

In FIG. **6** we see that the difference in pressure on the surfaces at small radius is much smaller than that at large radius. Therefore, if the radius of a rotor is very large the central tube of the rotor may be made with a large radius too. In that case the hole of the central tube for the shaft assembly may be made shorter in order to reduce the weight of the rotor. Then the rotor has a ring cross-section. FIGS. **15** and **16** illustrate a schematic side view and a schematic top plan view of a ring-rotor **148**, which is a modification of the rotor

shown in FIG. **4**. The cross-section perpendicular to the shaft of rotor **148** has a ring shape shown in FIG. **17**. In the figures ring-rotor **148** has a circumferential tube **150**, a central tube **152**, a shaft tube **154** for the shaft assembly, dividing walls **156**, a top ring **158** and an open bottom **160**. Dividing walls **156** extend from central tube **152** to circumferential tube **150** and from top ring **158** to open bottom **160**. Thus dividing walls **156** divide the space bounded by circumferential tube **150** and central tube **152** into separate sections. Central tube **152** is secured to shaft tube **154** by rods **162**. A ring-stator **164** shown in FIG. **18** together with ring-rotor **148** constitute their mutual pair. Ring-stator **164** has also a hole **166** for the outlet opening of a compensating gas means.

We notice that if disk-stator **52** of force generator **42** of mobile object **40** of FIG. **1** is removed, the difference in pressure distribution over the lower and upper surfaces of top disk **70** of rotor **54** still exists. Therefore, if generator chamber **48** is high enough such that the pressures at its ceiling and floor remain almost equal to the static pressure $\mathbf{P_0}$ during rotation of rotor **54** with disk-stator **52** removed, mobile object **40** still generates its self-action force. Of course the force generated by the rotor with the stator removed is too much smaller than the force generated by the force generator with the mutual pair the rotor and stator. The situation remains true for other types of rotor. Nevertheless, one special case is very interesting and useful. In that case a rotor of blades having an airfoil cross-section and being installed in a pressurized chamber can be used as a force generator.

Fig. **19** illustrates a mobile object, indicated generally at **168**, with a rotor of blades **170** having an airfoil cross-section and being installed in a pressurized generator chamber **172**. Rotor of blades **170** has a shaft **174**, which is supported for rotation by bearing supporters **176** and **178**. Bearing supporters **176** and **178** are secured to a structural frame **180** of mobile object **168**. Shaft **174** of rotor of blades **170** is operatively connected to an engine **182** by a gearbox **184**. A pump system **186** supports a high pressure in generator chamber **172**. Pump system **186** is powered from engine **182**. Generator chamber **172** should be high enough such that the pressures at its ceiling and floor are almost equal to the static pressure during rotation of rotor of blades **170**.

In operation, rotor of blades **170** is driven from engine **182** through gearbox **184**. Then the aerodynamic force or the lift created by rotor **170** can get a sufficiently large value due to the high pressure in generator chamber **172** and high angular velocity of rotor **170**.

That force acts on the whole body of mobile object **168** through the shaft, mechanical joints, fasteners, supporters, and structural frame of the mobile object. Thus mobile object **168** generates its self-action force that also does not depend on the outer environment surrounding the mobile object. Mobile object **168** distinguishes from conventional helicopters by the independence of its self-action force from outer environment and the possibility of the operation of rotor **170** at high pressure that allows reducing the size of its blades and increasing its angular velocity.

Mobile object **40** can accompany a body or a vehicle. Then the motion direction of the vehicle can be controlled by controlling the direction of the shaft of the force generator of the mobile object. In order to cancel the reactive moment of the rotor of the force generator it is desirable to install in the generator chamber two identical force generators rotating in opposite directions. The value of the force generated by each force generator can be controlled by controlling the angular velocity of its rotor due to regulating the angular velocity of its driving engine and a brake (not shown) for braking its rotor in necessary situations. In general, each vehicle can be equipped with a plurality of the force generators and a space inside the vehicle can be used as a generator chamber of its force generators.

FIG. **20** illustrates a mobile object indicated generally at **188**, which is a conventional aircraft equipped with the force generators for vertical take-off and landing. Mobile object **188** comprises an aircraft **190** of any type, two identical force generators **192** and **194**, which are powered from engines **196** and **198** respectively. Engines **196** and **198** are mounted to the structural frame of the body of aircraft **190** outside the body thereof. Force generators **192** and **194** are vertically (with the vertical upward direction of generated forces) mounted inside the body of aircraft **190** and rotate in opposite directions. The shafts of the rotors of force generators **192** and **194** are operatively connected to engines **196** and **198** by mechanical transmission means **197** and **199** respectively. The air inside the body of the aircraft is used as the working gas for the force generators. Force generators **192** and **194** may be also powered from engines (not shown) of aircraft **190** if its engines are turbo-fan or turbo-prop. However, from the point of view of high safety for flying, force generators **192** and **194** are better powered from their own engines as shown in FIG. **20**. Since the air inside the body of the aircraft is used as the working gas, force

generators **192** and **194** and engines **196** and **198** may be installed in any suitable location of aircraft **190**.

In operation, force generators **192** and **194** are driven from engines **196** and **198** through mechanical transmission means **197** and **199** respectively. The angular velocity of engines **196** and **198**, therefore and force generators **192** and **194**, are controlled by a control system (not shown) mounted in the cockpit (not shown) of aircraft **190**. During take-off force generators **192** and **194** lift aircraft **190** to a necessary height before starting its horizontal motion. During flying force generators **192** and **194** may be at rest or used to increase the height of the fly if it is necessary. During landing the force generators are controlled to provide a smooth vertical landing.

Mobile object **188** may be also equipped with force generators mounted horizontally (with horizontal orientation of their axes) for propulsion. In FIG. **20** force generators **200** and **202** are identical and mounted horizontally inside aircraft **190** for propulsion of mobile object **188**. Force generators **200** and **202** are powered from engines **204** and **206** respectively and rotate in opposite directions. The shafts of the rotors of force generators **200** and **202** are operatively connected to engines **204** and **206** by mechanical transmission means **205** and **207** respectively.

The use of force generators for lifting and landing of a conventional aircraft allows not only to increase its safety in flying, but also to remove its wings. If the wings of aircraft **190** are removed, mobile object **188** can fly at any altitude that does not depend on its speed. In that case either a conventional propulsion mechanism (not shown) or force generators **200** and **202** are used for propulsion.

Mobile object **188** is an aircraft of the combination of the force generator's technology with the conventional technology.

FIGS. **21** and **22** illustrate an alternative mobile object indicated generally at **208**, which comprises a conventional aircraft with its wings removed **210** and is equipped with force generators **212**, **214**, **216**, **218**, **220**, and **222**. Force generators **212**, **214**, **216**, and **218** are vertically mounted for lifting. Force generators **212** and **214** are identical and rotate in opposite directions. Force generators **216** and **218** are identical and rotate in opposite directions. Force generators **220** and **222** are identical, horizontally mounted for propulsion, and rotate in opposite directions. All the force generators **212, 214, 216, 218,**

220, and **222** are installed in a generator chamber **224** located under a floor **226** of aircraft **210**. The working gas in the generator chamber is the air. Force generators **212**, **214**, **216**, **218**, **220**, and **222** are powered from engines **228**, **230**, **232**, **234**, **236**, and **238** respectively. All the engines are mounted to the structural frame of the body of aircraft **210** outside the body thereof. The shafts of the rotors of force generators **212**, **214**, **216**, **218**, **220**, and **222** are operatively connected to engines **228**, **230**, **232**, **234**, **236**, and **238** by mechanical transmission means **229**, **231**, **233**, **235**, **237**, and **239** respectively. Mobile object **208** includes also a rudder **240**.

In operation, force generators **212**, **214**, **216**, **218**, **220**, and **222** are driven from engines **228**, **230**, **232**, **234**, **236**, and **238** through mechanical transmission means **229**, **231**, **233**, **235**, **237**, and **239** respectively. The angular velocities of engines **228**, **230**, **232**, **234**, **236**, and **238**, therefore and force generators **212**, **214**, **216**, **218**, **220**, and **222** are controlled by a control system (not shown) mounted in a cockpit **242** of aircraft **210**. Force generators **212**, **214**, **216**, and **218** are used for lifting and landing. Force generators **220** and **222** are used for propulsion. Mobile object **208** yaws by controlling horizontally mounted force generators **220** and **222**. Controlling the difference between the forces generated by force generator **220** and force generator **222** creates a necessary moment to yaw mobile object **208** to the right or to the left. Mobile object **208** can also yaw by controlling rudder **240**. Mobile object **208** pitches by controlling vertically mounted force generators **212**, **214**, **216**, and **218**. Controlling the difference between the total force generated by fore force generators **212** and **214** and the total force generated by backward force generators **216** and **218** creates a necessary moment to pitch mobile object **208** upwards or downwards. Mobile object **208** rolls by controlling vertically mounted force generators **212**, **214**, **216**, and **218**. Controlling the difference between the total force generated by right force generators **212** and **216** and the total force generated by left force generators **214** and **218** creates a necessary moment to roll mobile object **208** to the right or the left. Since the air density does not influence on the operation of the force generators, mobile object **208** can fly at any altitude.

A mobile object being a conventional vehicle such as an automobile, a train, a ship, or a submarine can be also equipped with the force generators like the conventional aircrafts equipped with the force generators illustrated in FIGS. **20-22**. The number of equipped

force generators for each vehicle is arbitrarily chosen in depending on the size and weight of the vehicle and the force each installed force generator can generate. In each vehicle some force generators are horizontally mounted for propulsion and some others are vertically mounted for lifting or diving. The vertically mounted force generators in each automobile, train, or ship direct their forces upward for lifting. The vertically mounted force generators in each submarine direct their forces downward for diving. Thus the automobile, train and ship equipped with the force generators can carry heavier weight or move faster. The submarine equipped the force generators can dive deeper and much easier maneuver in the depth.

FIG. **23** illustrates a mobile object, indicated generally at **244**, constructed in accordance with an alternative embodiment of the present invention. FIG. **24** is a schematic sectional view of mobile object **244** taken on line **24-24** in FIG. **23**. Mobile object **244** has a flying saucer shaped body **246** and includes a passenger cabin **248**, a machine cabin **250**, a generator chamber **252** and a cockpit **254**. The skin of body **246** is mounted to a structural frame **256**. The skin may be covered with a special protecting material for cosmos traveling. Passenger cabin **248** has a horizontal floor **258**, which behaves as a beam attached to structural frame **256** at its circumference. Machine cabin **250** has a ladder **260** for climbing up and down between cabins **248** and **250**. Passenger cabin **248** has a plurality of doors **262**, a plurality of screen windows **264**. Mobile object **244** has suspension piers **266** for standing on the ground and wheels **268**, which are able to lower for running on the ground when it is necessary. Mobile object **244** is also provided with photovoltaic panels **270** for generation of solar electricity, which can be extended by a mechanism (not shown) mounted under the panels. Generator chamber **252** is filled with the air and pressurized and contains force generators **272**, **274**, **276**, **278**, **280**, and **282** (see FIG. **24**). All the necessary supporters of the force generators are secured to structural frame **256**. The shaft of the rotor of force generator **272** is operatively connected to an engine **284** or an electrical motor **286** by a mechanical transmission means **288**. Engine **284** is connected to mechanical transmission means **288** by a means **285** selectively disengaging the engine, and electrical motor **286** is connected to mechanical transmission means **288** by a means **287** selectively disengaging the motor. The shaft of the rotor of force generator **274** is operatively connected to an engine **290** or an electrical motor **292** by a mechanical transmission means **294**. Engine **290** is

connected to mechanical transmission means **294** by a means **291** selectively disengaging the engine, and electrical motor **292** is connected to mechanical transmission means **294** by a means **293** selectively disengaging the motor. The shaft of the rotor of force generator **276** is operatively connected to an engine **296** or an electrical motor **298** by a mechanical transmission means **300**. Engine **296** is connected to mechanical transmission means **300** by a means **297** selectively disengaging the engine, and electrical motor **298** is connected to mechanical transmission means **300** by a means **299** selectively disengaging the motor. The shaft of the rotor of force generator **278** is operatively connected to an engine **302** or an electrical motor **304** by a mechanical transmission means **306**. Engine **302** is connected to mechanical transmission means **306** by a means **303** selectively disengaging the engine, and electrical motor **304** is connected to mechanical transmission means **306** by a means **305** selectively disengaging the motor. The shafts of the rotors of force generators **280** and **282** are operatively connected to an engine **308** or an electrical motor **310** by a mechanical transmission means **312**. Engine **308** is connected to mechanical transmission means **312** by a means **309** selectively disengaging the engine, and electrical motor **310** is connected to mechanical transmission means **312** by a means **311** selectively disengaging the motor. Machine cabin **250** is also equipped with an auxiliary power unit **314** and a pump system **316** for pressurization of generator chamber **252** and passenger cabin **248**. There is a special gateway **318** between machine cabin **250** and generator chamber **252**. Force generators **272**, **274**, **276**, and **278** are identical and vertically mounted for lifting. Force generators **272**, **274**, **276**, and **278** are located at an equal distance from the central axis of the body of mobile object **244**, and at an equal distance from each other. The direction of rotation of the shafts of force generators **272** and **274** and the direction of rotation of the shafts of force generators **276** and **278** are opposite. Force generators **280** and **282** are identical and mounted horizontally on a turntable **320**. The shafts of force generators **280** and **282** are parallel, rotate in opposite directions and their generated forces have the same direction. The axis of turntable **320** coincides with the central axis of the body of mobile object **244**. This means that the shafts of force generators **280** and **282** are parallel to floor **258**, and the forces generated by force generators **280** and **282** have their direction perpendicular to the direction of the forces generated by force generators **272**, **274**, **276**, and **278**. Turntable **320** can turn on its

axis any angle by the help of a control motor **322**. A structure of turntable **320** is shown in FIG. **25**. Turntable **320** includes a turning supporter **324** and a structural supporter **326**. Turning supporter **324** is used for securing the frames of force generators **280** and **282**. Structural supporter **326** is secured to structural frame **256** and used for supporting turning supporter **324**. Turning supporter **324** has a gearwheel **328** underneath, which is driven for turning by a small gearwheel **330** of a gear train (not shown) driven from control motor **322**. The control motor is powered from auxiliary power unit **314**. Turntable **320** has a hole **332** at its center for the line of power transmission and a cylindrical shaft **334**. Turning supporter **324** is supported on a suitable bearing **336** for rotation on structural supporter **326**. Cylindrical shaft **334** rotates in a bore **338** of structural supporter **326**. Suitable sleeve bearing may be provided in bore **338**. For correct coordination of the operation of turntable **320** with the power transmission from engine **308** or electrical motor **310** to force generators **280** and **282** a shaft **340** rotating in hole **332** is jointed to a clutch **342** under the turntable. The flywheel of clutch **342** is jointed to a shaft **343**, which is the output of mechanical transmission means **312**. A control unit **344** including all the control panels and necessary steering tools of mobile object **244** is mounted in cockpit **254**. All the necessary mechanical, hydraulic, and electrical transmission lines and circuits (not shown) connecting the control panels and steering tools of mobile object **244** with their objects such as the engines, actuators, motors, turntable, clutch, control motor, wheels and their brakes are mounted suitably in machine cabin **250** and generator chamber **252**. For supplying fuel to the engines fuel tanks **345** together a system of pumps and valves (not shown) are arranged in machine cabin **250** so that the center of gravity of mobile object **244** as closer to its center of gravity as possible. Mobile object **244** may be also provided with external drop fuel tanks (not shown). Hydraulic-mechanical systems (not shown) for lowering and braking wheels **268** of the mobile object are powered from auxiliary power unit **314**.

In operation, force generators **272**, **274**, **276**, and **278** are driven from engines **284**, **290**, **296**, and **302** through mechanical transmission means **288**, **294**, **300**, and **306** respectively or electrical motors **286**, **292**, **298**, and **304** through mechanical transmission means **288**, **294**, **300**, and **306** respectively. Force generators **280** and **282** are driven from engine **308** or electrical motor **310** through mechanical transmission means **312**. The

angular velocities of engines **284**, **290**, **296**, **302**, and **308** or electrical motor **286**, **292**, **298**, **304**, and **310**, therefore and force generators **272**, **274**, **276**, **278**, **280**, and **282** are controlled by control unit **344**. Force generators **272**, **274**, **276**, and **278** lift mobile object **244** in the direction of the vertical axis of the mobile object. Force generators **280** and **282** thrust mobile object **244** in a direction perpendicular to the vertical axis of the mobile object. The instant direction of the thrusting force of force generators **280** and **282** is defined by the instant turning angle of turntable **320**, which is controlled by control motor **322**. Then mobile object **244** can implement any translation motion in space by combination of the lifting and thrusting forces. Mobile object **244** maneuvers by controlling the forces generated by force generators **272**, **274**, **276**, **278**, **280**, and **282** to create necessary moments. Mobile object **244** rolls about the axis of symmetry between the pair of force generators **272** and **274** and the pair of force generators **276** and **278** by creation of the difference between the total force generated by force generators **272** and **274** and the total force generated by force generators **276** and **278**. Mobile object **244** rolls about the axis of symmetry between the pair of force generators **272** and **278** and the pair of force generators **274** and **276** by creation of the difference between the total force generated by force generators **272** and **278** and the total force generated by force generators **274** and **276**. Mobile object **244** rolls about the axis of symmetry between force generators **272** and **276** by creation of the difference between the force generated by force generator **272** and the force generated by force generator **276**. Mobile object **244** rolls about the axis of symmetry between force generators **274** and **278** by creation of the difference between the force generated by force generator **274** and the force generated by force generator **278**. Thus mobile object **244** can implement almost any maneuver in any direction in space by controlling force generators **272**, **274**, **276**, **278**, **280**, and **282**, and turntable **320**. When mobile object **244** flies at very high altitude or in cosmos, solar energy converted to electrical energy by photovoltaic panels **270** can be used for powering electrical motors **286**, **292**, **298**, **304**, and **310**. Particularly, in cosmos mobile object **244** can continue accelerate by using solar energy or universe energy up to desirable velocity and the fuel on board can be saved for emergencies. Since the value and direction of the self-action force can be controlled and do not depend on the air density, mobile object **244** can come out to the cosmos and return into the atmosphere smoothly.

Mobile object **244** shown in FIGS. **23** and **24** includes four vertically mounted force generators and two horizontally mounted force generators. In general, the number of equipped force generators and their arrangement in the mobile object can be chosen arbitrary. That depends on the characteristics of the equipped force generators and the mass, volume, and specific functions of the mobile object. For example, if force generators **274** and **278** of mobile object **244** are removed, the lift and the possibility of maneuver of the mobile object are reduced. For other example, if mobile object **244** is equipped with another additional pair of horizontally mounted force generators, the propulsion and the possibility of maneuver of the mobile object are larger. Since the forces generated by the force generators do not depend on the outer environment surrounding the mobile object, the shape of the body of the mobile object can be changed as desired. In other words, the shape of each mobile object equipped with force generators may be chosen arbitrary in depending on its specific purposes.

If a mobile object equipped with the force generators flies at a low altitude near the earth surface and its volume is desired to be as small as possible for a given passenger space, the number of the equipped force generators may be reduced by adding other members.

FIGS. **26** and **27** illustrate a mobile object, indicated generally at **346**, which is a small vehicle flying near the earth surface and serves as a flying car. Mobile object **346** has a body of aerodynamic shape **348** and includes a pilot cabin **350**, a machine cabin **352**, and a rudder **354**. The skin of body **348** is secured to a structural frame **356**. Pilot cabin **350** has a horizontal floor **358**, which behaves also as a beam attached to structural frame **356**. Floor **358** may have a lower section **360** if the pilot cabin is too small. Pilot cabin **350** has a glass screen **362** for pilot vision. A door **364**, which is a section of the top of the pilot cabin, has hinges (not shown) and can be closed-off for pilot climbing. Mobile object **346** has suspension piers **366** for standing on the ground and wheels **368**, which are able to lower for running on the ground when it is necessary. Mobile object **346** is equipped with force generators **370** and **372** (see FIG. **27**), which are arranged in machine cabin **352**. Thus machine cabin **352** serves also as a generator chamber, since the natural air in the atmosphere is used as a working gas for the force generators. The shaft of the rotor of force generator **370** is operatively connected to an engine **374** by a mechanical transmission means **376**. The shaft of the rotor of force generator **372** is operatively

connected to an engine **378** by a mechanical transmission means **380**. Engines **374** and **378** are mounted in machine cabin **352**. Force generators **370** and **372** are identical and rotate in opposite directions. Force generators **370** and **372** are vertically mounted on the upper plane of a rectangular frame **382**. Frame **382** has a shaft **384**, which is supported by suitable bearings (not shown) arranged in struts **386** and **388**. Struts **386** and **388** are secured to structural frame **356**. One of the edges of frame **382** is operatively jointed with the tops of hydraulic jacks **390** and **392**, which control the angle between the upper plane of rectangular frame **382** and the horizontal plane. Hydraulic jacks **390** and **392** operate by the help of a pump **394** and a hydraulic circuit **396**. Pump **394** is operatively connected to an engine **398** by a mechanical transmission means **400**. Hydraulic jacks **390** and **392**, pump **394**, hydraulic circuit **396**, engine **398**, and mechanical transmission means **400** are secured to structural frame **356**. A control unit **402** including all the control panels and necessary steering tools of mobile object **346** is mounted in the front of pilot cabin **350**. Hydraulic mechanical systems (not shown) for lowering and breaking the wheels of the mobile object are powered from engine **398**. A fuel tank **404** is mounted in machine cabin **352** so that the center of gravity of mobile object **346** is as closer to the center of the mobile object as possible.

In operation, force generators **370** and **372** are driven from engines **374** and **378** through mechanical transmission means **376** and **380** respectively. Hydraulic jacks **390** and **392** raise or lower the edge of rectangular frame **382** jointed with their tops to give a desirable angle of the axes of force generators **370** and **372** relative to the horizontal plane. Then the total force created by force generators **370** and **372** is resolved into the vertical component and horizontal component. The vertical component is the lift of mobile object **346** and the horizontal component is the propulsion of the mobile object. Thus mobile object **346** can lift, hover in the air, and fly forward or backward by controlling the operation of force generators **370** and **372** and hydraulic jacks **390** and **392**. Mobile object **346** yaws by controlling rudder **354**. Mobile object **346** rolls by creating a difference between the lifting forces generated by force generators **370** and **372**. If a lower part of the skin of body **348** is sealed, mobile object **346** can sail on water surface. Mobile object **346** runs on the ground by wheels **368**. Thus mobile object **346** can take-off, hover in the mid-air, fly forward and backward, land, run on the ground, and sail on the water surface.

For increasing flying speed mobile object **346** may be further equipped with an additional propulsion mechanism that may be a horizontally mounted force generator (not shown) or a conventional propulsion mechanism (not shown).

From the foregoing, it will be seen that the present invention provides a new generation of vehicles. The distinguished advantage of the new vehicles is their ability to generate self-action forces, which do not depend on outer environment surrounding them. The advantage is achieved by equipping the vehicles with a plurality of force generators, which are principal components of the invention. The independence from outer environment makes the vehicles universal, much more flexible, and safer, and the infrastructure for their exploitation simpler and cheaper. The advantages of the force generators as propulsion mechanisms are their ability to be enclosed in any vehicle and generate very large forces from any source of energy, since any source of energy can be converted into rotational. The enclosure of the force generators makes the motion of the vehicles much more quiet than that of the conventional ones due to ability of damping noisy down to minimum.

An aircraft equipped with the force generators can take-off and land vertically, hover in space, fly at any altitude being independent of speed of flying, and implement flexible maneuvers. The vertical take-off and landing makes the aviation transport systems much more flexible, simpler, safer, and cheaper.

A flying car equipped with the force generators can take-off and land vertically, hover in the mid-air, fly forward and backward, implement flexible maneuvers, run on the ground, and sail on the water surface. The size of the flying car can be made sufficiently small as an automobile. Therefore, the application of the flying car can solve the jam problem of the traffic system on the ground.

A flying saucer equipped with the force generators is a universal vehicle in the earth's atmosphere and in the cosmos. The flying saucer can accelerate in any direction, implement very complicated maneuvers, come out to the cosmos and return in to the atmosphere smoothly.

A spaceship, which may be the above flying saucer, can continue accelerate in cosmos up to desirable velocity by using the solar or universe energy.

An automobile, a train, and a ship equipped with the force generators can carry heavier loads or move faster.

A submarine equipped with the force generators can dive deeper and maneuver easier in the depth.

A town in cosmos can be constructed as large as desirable by using a large number of force generators.

Flying robots for different purposes can be made by using the force generator's technology.

Accordingly, the main objects and advantages of my invention are to provide vehicles with mechanisms which allow the vehicles to generate their self-action forces for starting, accelerating, lifting, landing, and moving in any direction in the air, cosmos, and water (if it is sealed) and on any ground surface and water surface (if the lower part of its body is sealed). The vehicles will make the mankind's transport system much more flexible, simple, cheap, and faster in both the earth's environment and universe.

The foregoing description illustrates preferred embodiments of the invention. However, it will be apparent to those skilled in the art that the principles and concepts employed in such description may be employed in other embodiments without departing from the scope of the invention. Accordingly, the following claims are intended to protect the invention broadly, as well as in specific forms shown herein.